REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 5, 7, 9, 12-13, 19, 22, 27, 29, 33 and 37-39 are presently active in this case. The present Amendment amends Claims 5, 7, 9, 12-13, 19, 22, 27, 29, 33 and adds Claims 37-39.

First, Applicants wish to thank the Examiner for discussing the outstanding issues in this case with Applicants' representative. The present Supplemental Amendment is submitted based on this discussion, during which no formal agreement was reached. In particular, the present Supplemental Amendment amends the claims to be directed to a method of operating a light-receiving device. Claim 33 is also amended to replace "and" with "or" in the recitations regarding the carriers being electrons and holes in order to clarify Claim 33. New dependent Claims 37-39 recite features previously recited in Claim 33. Specifically, Claim 37 recites that the excited electrons flow to the p-layer; Claim 38 recites that the excited holes flow to n-layer; and Claim 39 recites that the quantum-wave interference layer units and the carrier accumulation layer are positioned in the intermediate layer. The changes to the claims are not believed to raise a question of new matter.

Applicant respectfully submits that the claims as amended are patentably distinct over the prior art, as discussed next.

The claims are amended to be directed to a method of operating a light-receiving device having the structure specified in Claim 33. The claimed method includes a step of forward biasing the light-receiving device by applying a positive voltage to the p-layer such that carriers having the wavelength λ_W are produced in the quantum-wave interference layer units. This feature is clearly explained and supported in Applicants' disclosure. In particular,

Applicant's disclosure explains how to make and use the claimed light-receiving device and how to operate it. The prior art fails to teach or suggest the claimed method of operating the claimed device. In particular, the Capasso et al. patent and the Sze publication fail to teach or suggest forward biasing a light-receiving device, such as the one recited in Claim 33, by applying a positive voltage to the p-layer such that carriers having the wavelength λ_W are produced in the quantum-wave interference layer units. The Sze publication teaches away from the claimed method by applying a positive voltage to the n-layer so that the electric potential gradient of the i-layer increases. In other words, the Sze diode is used under reverse bias. In Sze's diode, electrons flow to the n-layer side and holes flow to the p-layer side. By contrast, in Applicant's claimed invention, the claimed device is forward biased (Claim 33) and electrons flow to the p-layer side and holes flow to the n-layer side (dependent Claims 37-38). This feature results from forming the claimed multiple layer structure, which transmit electrons and holes. Accordingly, Applicant's method of operating is completely different from any method of operating light-receiving devices, disclosed by the cited prior art.

Furthermore, the light-receiving device recited in Claim 33 includes a carrier accumulation layer having a band gap narrower than that of the second layer. The record does not clearly show how the Capasso et al. patent meets this feature of the claimed light-receiving device. Furthermore, there is no evidence that such feature, if incorporated into the Capasso et al. device, would maintain the appropriate constructive interference leading to Capasso et al.'s desired localized states for electrons. The pages from the Sze document do not provide such evidence. Therefore, even if the combination of the Capasso et al. patent and Sze document is assumed to be proper, the combination fails to teach every element of the claimed light-receiving device. In view of the above, Applicant respectfully submits that

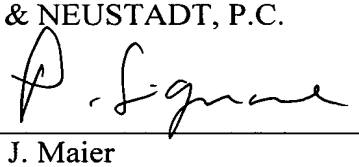
the method of operating the light-receiving device recited in Claim 33 is patentably distinct over these documents.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 5, 7, 9, 12-13, 19, 22, 27, 29, 33, and 37-39 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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